CLAIMS

1. An electronic silicon device comprising:

a silicon substrate comprising a planar surface;

a trench disposed in said planar surface of said silicon substrate, said trench comprising a wall and a bottom;

a silicon dioxide layer disposed on the bottom of said trench and also on a portion of said wall, said layer being terminated at a distance D below said planar surface of said silicon device;

a polysilicon fill disposed on the surface of said silicon dioxide layer and on a portion of said wall.

2. The electronic silicon device of Claim 1, wherein said polysilicon fill comprises an upper surface that is disposed within a distance D from said planar surface of said silicon substrate.

3. The electronic silicon device of Claim 1, further comprising a junction field effect transistor (JFET).

4. The electronic silicon device of Claim 1, further comprising a metal oxide semiconductor field effect transistor (MOSFET).

5. The electronic silicon device of Claim 1, further comprising an integrated circuit.

6. The electronic silicon device of Claim 1, wherein said trench is disposed above a gate.

7. The electronic silicon device of Claim 1, wherein said trench is disposed adjacent to a source.

8. The electronic silicon device of Claim 1, wherein said silicon dioxide layer is between 100 angstroms and 3000 angstroms in thickness.

9. The electronic silicon device of Claim 1, wherein said silicon dioxide layer is thermally grown.

10. The electronic silicon device of Claim 1, wherein said silicon dioxide layer is deposited.

11. A method for filling a trench, comprising a wall and a bottom, disposed in a surface of a planar silicon substrate, comprising:

forming a layer of silicon dioxide on the bottom and on a portion of the wall of said trench, wherein said layer of silicon dioxide is terminated at a distance D from the surface of said planar silicon substrate; and,

depositing a polysilicon fill on the surface of said layer of silicon dioxide and on the surface of said wall.

12. The method of Claim 11, wherein said forming said layer of silicon dioxide comprises thermally growing said layer of silicon dioxide.

13. The method of Claim 11, wherein said forming of said layer of silicon dioxide comprises depositing said layer of silicon dioxide.

14. The method of Claim 11, further comprising:

depositing a first portion of said polysilicon fill;

etching said first portion of said polysilicon fill, and

depositing a second portion of said polysilicon fill.

15. A method for fabricating a composite trench fill in a planar silicon substrate, comprising:

forming a first oxide coating on said planar silicon substrate;

forming a first polysilicon coating on said first oxide coating;

etching a trench into said planar silicon substrate through said first polysilicon coating and said first oxide coating;

forming a second oxide coating on the surface of said trench and said substrate;

forming a second polysilicon coating on the surface of the second oxide coating such that said trench is completely filled with a combination of oxide and a first polysilicon fill;

removing a portion of said second polysilicon coating such that the upper surface of the first polysilicon fill in said trench is approximately level with the surface of the substrate;

removing a portion of said second oxide coating to produce a gap between said substrate and said first polysilicon fill;

depositing a third polysilicon coating to produce a second polysilicon fill that completely fills said gap; and,

etching back said third polysilicon coating such that the surface of the second polysilicon fill is approximately level with the surface of said substrate.

16. The method of Claim 15, wherein said first oxide coating is between 100 angstroms and 5000 angstroms thick.

17. The method of Claim 15, wherein said second oxide coating is between 100 angstroms and 2000 angstroms thick.

18. The method of Claim 15, wherein said first polysilicon coating is between 1000 angstroms and 3000 angstroms thick.

19. The method of Claim 15, further comprising removing said first oxide coating.

20. The method of Claim 11, further comprising an ion implantation of the bottom of said trench.